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No. 52

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CONSTRUCTION

MINISTER ZHIGALIN ON HEAVY, TRANSPORT MACHINEBUILDING

Moscow AGITATOR in Russian No 17, Sep 81 (signed to press 13 Aug 81) pp 22-25

[Article by USSR Minister of Heavy and Transport Machinebuilding V. F. Zhigalin:  
"Machines Marching Into the Future"]

[Text] We have created a powerful, multibranch machinebuilding industry. It is second in the world in total production volume and first in the production of many types of equipment and machinery (tractors, combines, diesel locomotives, electric locomotives, machine tools). Hundreds of new shops and plants have been put into operation in recent years, production of various equipment has been increased, and the production of automobiles, apparatus and computer equipment and agricultural machinery has been expanded. "The combining of science and production and the impact of practical ideas on it," Comrade L. I. Brezhnev noted, "occur in practice through machines and technology. Hence, machinebuilding plays an incomparable role in developing the national economy and increasing labor productivity." The "Basic Directions of USSR Economic and Social Development in 1981-1985 and Up To 1990" approved by the 26th CPSU Congress outline the continued, outstripping development of machinebuilding and metalworking. Their output volume is to increase at least 1.4-fold in the 11th Five-Year Plan. The demand for machines and equipment to mechanize and automate production will be more fully met in all branches of the national economy. At the same time, we plan a steady reduction in metal- and energy-consumption and the cost of machinery per unit of final useful impact. The key position in solving the tasks set is occupied by enterprises and institutes of heavy and transport machinebuilding. At the request of the editors, Hero of Socialist Labor V. F. Zhigalin, minister of this branch, talked about what new units and machine complexes will be produced this five-year period.

Enterprises of our ministry are providing such leading branches of the national economy as ferrous and nonferrous metallurgy, rail transport, coal, mining, chemical, petroleum and gas industry with new equipment, machinery and technology, manufacturing means of mechanizing and automating lift-transport, loading-unloading and warehousing jobs, and producing consumer goods and machinery and equipment for agriculture.

The production volume and technical level of output rose substantially in the 10th Five-Year Plan. But we are faced with resolving more complex tasks in the 11th Five-Year Plan. The branch operates some of the world's largest machinebuilding associations, including the Uralmash, Novo-Kramatorskiy, Zhdanovtyazhmarsh and others. But even their production capacities will be inadequate in the 1980's. Given the high rates of industrial development of the eastern regions, we will still have to be bringing a large portion of the machinery they need in from the nation's center.

In order for these regions to produce the machinery they need themselves, the Krasnoyarskiy Heavy-Duty Excavators Plant must be put up quickly in the 11th Five-Year Plan. The following comparison provides a graphic idea of the size of this new enterprise. Uralmash now produces one walking dragline excavator with a 40 m<sup>3</sup> scoop and 80-meter boom every two years. It is a huge machine: high as an 18-story building, scoop big enough to hold a KamAZ truck. The Krasnoyarskiy plant will produce eight such giant machines each year, as well as 50 12.5 m<sup>3</sup> excavators. And it will begin producing them in the 11th Five-Year Plan. They will ensure continued growth in open-pit coal mining.

The Soviet Union has long and firmly held first place in the world in ferrous metals production. But they are still scarce, especially as rolled metal. In the 11th Five-Year Plan, we will create powerful new units intended basically for renovating existing metallurgical enterprises, as well as for building new ones. A sharp increase is planned in the most labor-intensive equipment -- machine tools for cold rolling and units for applying protective coatings to sheet metal and metal tape, steel smelting machines and machines for continuously casting steel blanks.

This year, a double squirrel-cage mill for cold-rolling tin for the canning industry will be manufactured for the Karaganda Metallurgical Combine. Magnitka metallurgists will be receiving new equipment for the carbon strip cold-rolling shop. Specialists and workers at Elektrostal Heavy Machinebuilding Plant association will develop units for welding large-diameter, unique multilayer pipe for gas pipelines with high throughput capacities. Such pipe will be able to withstand higher pressures than before, which will provide an opportunity for pumping considerably more gas through pipes of the same diameter. Technical documentation for a huge new furnace with a usable volume of 5,580 m<sup>3</sup> is being worked out for Cherepovets Metallurgical Plant.

Practice has shown that rolled and other metal production can be increased two- to three-fold faster and cheaper by renovating existing enterprises than by building new plants. This is why priority is being given to manufacturing machinery and units for re-equipping blooming mills at Magnitka and Krivoy Rog and Yenakiyevskiy metallurgical plants and for renovating the 2500 thin-sheet mill at Magnitka and the 2000 at Novolipetskiy. And that is not because the units cited are old. They were in fact built comparatively recently. But the level of today's scientific and technical achievements has risen significantly, requiring the renovation of many of the largest ferrous metallurgy enterprises.

The Soviet Union is the birthplace of the unique continuous steel teeming installations (UNRS). We license their use in many industrially developed countries. But scientists and designers have not stopped there; they are constantly improving the UNRS's, and their production is increasing. The Yuzhno-Ural'sk Heavy Machinebuilding Plant alone will deliver 25 of them this five-year plan. And the Uralmash workers will also make an important contribution here. They have developed and introduced

a slab unit to produce 1.25 million tons of steel per year, as well as other machinery.

Units with previously unheard-of parameters are also being developed. This five-year plan, branch enterprises will deliver to metallurgists a unique thin-sheet mill for producing aluminum slabs and sheet and a mill for hot-rolling 4,600-mm wide steel slabs.

Rapidly increasing Siberian gas extraction is a problem of top-priority state importance. In order to solve it successfully, we need to have more powerful machinery and units. The efforts of branch collectives have been oriented towards this task. For example, the Uralmash association alone will produce 2,025 highly productive drilling installations this five-year plan. Of those, 445 are designated for Western Siberia.

Of course, machinebuilders will not simply be increasing the amount of equipment being produced. The main thing is to improve quality, to continuously improve it. Our machines must be highly productive, powerful, reliable, durable and economical to operate, less metals- and energy-intensive than previous models.

Quite a few such machines and units have already been created in the branch. For example, history has never known drilling installations like the Uralmash 15000. They have successfully drilled super-deep wells through the hardest rock on Kol'skiy Peninsula and in Azerbaijan. The depths reached there are over 10,000 and 8,000 meters, respectively.

The extraction of petroleum, gas and other very important raw materials here is increasing continuously. But their sources are increasingly remote in the north and east. New cities, enterprises and very large territorial-production complexes are growing up there. In this connection, the role of rail transport is increasing. For this reason, we plan a significant increase in the production and improvement in the quality of freight and passenger mainline and switching diesel locomotives.

Progressive structural changes are occurring in rail car building. Production of mainline freight cars will be increased. Zhdanovtyazhmash association will increase its production of tank cars and gondola cars. Particular attention is being paid to manufacturing specialized rolling stock: gondola cars for shipping coal and ore, closed hopper cars for grain, cement and mineral fertilizers, and flat cars for large containers. The Stakhanovskiy plant will provide new automatic-unloading cars, which will enable us to increase labor productivity three- to four-fold in loading and unloading work. That will enable us to free tens of thousands of people now employed in difficult jobs.

Diesel locomotive builders have developed and will be producing 30 new engine modifications with nearly 1.5-fold higher motor capacity and 20-30 percent greater power. The national economy will be receiving tens of thousands of such engines in 1985.

Machinebuilders will be participating in the resolution of yet another most important task, that of producing machinery to eliminate manual labor. Steps have been outlined for comprehensively mechanizing labor-intensive sectors. We are faced with accelerating work on the latest directions in automation, including the production of industrial robot-manipulators. It was toward resolving this very task that we were oriented by the recent All-Union Machinebuilders' Conference in Moscow. Such robots

are capable of lifting both very light parts and ones weighing up to 160 kg. We plan to introduce 400 manipulators and automated operators just at enterprises of our ministry in the 11th Five-Year Plan, and the branch as a whole will produce 1,500 automated and balanced manipulators for the national economy during that period.

Plants will master 900 new or significantly updated machines during the five-year plan, and a large number of obsolescent models will be withdrawn from production.

Heavy and transport machinebuilding has charted a course towards producing modern machinery and equipment in the 11th Five-Year Plan which will facilitate the economical use of material-technical resources, and especially metal, fuel and energy, as well as increasing unit power.

Let me take this opportunity to comment positively on a whole series of branch enterprises which have begun the new five-year plan successfully. The best results have been achieved by collectives of the Uralmash, Nevo-Kramatorskiy Machinebuilding Plant and Bryansk Machinebuilding Plant associations, Alma-Ata Heavy Machinebuilding Plant and others. Thus, Bryansk machinebuilders are currently producing 68.5 percent of their items with the honored pentangle [State Badge of Quality] and Dneprodzerzhinsk rail car builders -- 65.3 percent, while the average branch indicator is 34 percent.

I should especially like to note the high labor indicators of the collective of the Leningrad Lift-Transport Equipment Plant imeni Kirov. It won the challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU and Komsomol Central Committee every year of the 10th Five-Year Plan. Leningraders have also started the first year of the new five-year plan successfully, guaranteeing the reliability and durability of their output. All gantry cranes with the plant brand have the state Badge of Quality.

At the same time, machinebuilders realize that there are still quite a few shortcomings and unsolved problems. The effectiveness of production assets use is still not high at ministry plants and available capacities are not fully loaded. The equipment shift index last year had not only not risen as compared with 1975 at individual ministries, but had even dropped. This indicator was especially low at Lyudinovskiy Diesel Locomotive Plant, Khar'kov Lift-Transport Equipment Plant, Dvigatel' Revolyutsii plant in Gor'kiy. Solving these problems means using one of the reserves for increasing production efficiency.

Experiments were begun back in the Eighth Five-Year Plan on introducing the brigade form of labor organization and stimulation in heavy and transport machinebuilding. In the 10th, we developed the branch system of studying, disseminating and introducing this experience. Base variants of production brigade organization were proposed for all-union industrial associations to check the effectiveness of their application under various conditions. These questions have constantly been under the intense scrutiny of the scientists of branch scientific research institutes and the leaders and specialists of enterprises, party and trade-union organizations.

Branch, plant and shop schools for studying brigade labor problems have helped disseminate this experience. Base association and enterprise schools have held exercises following special study plans and programs. During the 10th Five-Year Plan, there were 28 such schools covering more than 700 workers, enterprise and production subdivision leaders and specialists. About 4,000 plant and shop schools were based

at branch schools, training upwards of 20,000 people. The experience of the leading associations and enterprises -- Uralmash, Novo-Kramatorskiy Machinebuilding Plant, Elektrostal'tyazhmash, Bryansk Machinebuilding Plant, Voroshilovgradteplovoz, the Dnepropetrovskiy Metallurgical Equipment Plant, Yuzhno-Ural'skiy Machinebuilding Plant -- has been widely supported thanks to this.

The whole branch knows the famous workers who have been the foundations of brigade labor organization -- Hero of Socialist Labor A. I. Khramtsov, USSR State Prize winners V. A. Zaytsev, V. G. Konovalov, M. D. Vorob'yev, I. F. Zyunev and others.

Whereas only a quarter of all branch workers were working in brigades at the start of the Ninth Five-Year Plan, the figure is 60 percent this year. The demand for professionally trained personnel has decreased by 3,700 people due to the introduction of this new form of labor organization and stimulation.

On the initiative of the leading branch collectives, competition has developed under the slogan "1981 Assignments by 7 November and Five-Year Plan Assignments by 115th Anniversary of the Birth of V. I. Lenin." The "Leading Experience to Each, Highest Productivity at Each Workplace" movement has been born at the Novo-Kramatorskiy Machinebuilding Plant production association. Its initiators were 26th CPSU Congress delegate A. V. Chicherinda and other leading production workers.

Hero of Socialist Labor V. M. Yarygin, a boring lathe operator at Elektrostal'tyazhmash production association and delegate to the 26th CPSU Congress, and the Gorokhovetskiy Lift-Transport Equipment Plant multipurpose brigade in which 26th CPSU Congress delegate and lathe operator N. I. Grezdova works have adopted counter plans and socialist obligations to meet the 1981 assignments and 11th Five-Year Plan ahead of schedule.

Production associations and enterprises of the Ministry of Heavy and Transport Machinebuilding fulfilled the half-year plan 100.7 percent in terms of normative net output. However, the branch also has enterprises which have permitted lag in and violations of schedules for shipping consumers needed equipment. Our very first task is to eliminate these shortcomings.

Each branch worker and each collective is making its own contribution to meeting the plans for the current year and the 11th Five-Year Plan as a whole ahead of schedule and greets the occupational holiday, Machinebuilders' Day, in a worthy manner.

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## CONSTRUCTION

### FIRST DEPUTY MINISTER OF GOSSTROY DISCUSSES PROJECT ESTIMATION

Moscow EKONOMIKA STROITEL'STVA in Russian No 6, Jun 81 (signed to press 3 Jun 81)  
pp 3-11

[Article by A. A. Borovoy, first deputy chairman of USSR Gosstroy: "A New Stage of Perfecting Design and Estimate Affairs"]

[Text] The CPSU Central Committee and USSR Council of Ministers have approved a decree "Concerning Measures for Further Improving Design and Estimate Matters." It has huge importance for solving many of the urgent problems in designing capital construction projects.

The importance of the resolutions that have been approved is determined by the special role of design work in the national economy: the overall state programs for economic construction that are outlined by the plans for developing the national economy and by the decisions of management agencies begin to be brought to fruition by working out designs.

The technical level and economic indicators of enterprises, buildings and structures, the quality of the products turned out by them, the length of construction and development of the designed capacities, the rates of technical progress in the sectors of the national economy, in industry and in construction production, the degree of its mechanization and industrialization, the reduction in the consumption of material resources, power and raw materials and the decrease in the cost and labor consumption of work depend on how advanced the design approaches are.

Developed on the basis of principles that were defined by the CPSU Central Committee and USSR Council of Ministers decree "Concerning an Improvement in Design and Estimate Matters," which was approved in 1969, design work has occupied an important place in social production. At the same time its role in improving the efficiency of capital construction has grown.

The broad network of design and research organizations encompasses more than 1,800 organizations which number more than 800,000 people. The total annual amount of design and research work completed by them reached almost 3 billion rubles.

As a result of the measures taken the technical and economic level of the designs grew. A large number of enterprises, buildings and structures were designed and built in all sectors of the national economy and industry which meet modern demands for scientific,

technical and social progress. Among them are such giants of industry as the Volga motor vehicle plant in Tol'yatti, the Kama motor vehicle complex in Naberezhnyye Chelny, Attommash, the Ust'-Ilimskiy paper and pulp combine, the blast furnace at the Krivoy Rog Metallurgical Plant which has a volume of 5,000 cubic meters and is the largest in the world, the Leningrad, Kursk and Chernobyl' AES, the Tiraspol' and Bukhara cotton combines and many others.

Over the past ten years 435 USSR Council of Minister bonuses were awarded to collectives--those taking part in developing the most distinguished designs and building enterprises, buildings and structures according to these designs, and designs for planning and building cities and other populated areas which have become widely recognized by the public and which reflect the achievements of modern science and technology.

However, during the given period great qualitative changes have occurred in the country's economic structure and the management of it during which deficiencies in design and estimate matters have begun to affect the status of affairs in capital construction especially noticeably.

Comrade L. I. Brezhnev emphasized in his report to the CPSU Central Committee at the 26th Party Congress: "It is impossible to adapt a living developing organism for managing the economy to settled habitual forms. On the contrary, the forms must be made to conform with changing economic goals."

The large scale tasks standing before capital construction at the current stage of developing the country's economy were stipulated by the measures specified in the CPSU Central Committee and USSR Council of Ministers' decree concerning an improvement in design and estimate matters. In order to more fully evaluate the significance of these measures one should pause at length on the deficiencies they are intended to eliminate.

Until recent times planning design and research work and working out designs were poorly coordinated with the capital construction plans and the long range outlook for developing the sectors of the national economy and industry, and were done in many instances unsystematically. At the same time lengthy justifications and coordination with interested organizations and planning agencies was required to include projects in plans. In essence, beginning with 1971, the requirement of accepting approaches for designing and building enterprises and structures on the basis of schemes for developing and locating sectors of the national economy, industry and production forces was, thus, not fulfilled. As a result, with the constant growth in the amount of design and research work a large number of construction projects were not provided with approved designs and estimates on time.

In recent years the amount of unused design and estimate documentation has increased sharply--construction is done on the average according to only two out of three of the designs that are worked out.

The uneven workload on design and research organizations, which gives rise to crash work, is inflicting noticeable harm on the quality of design work.

Scientific and technical achievements and advanced expertise in design and construction work are not sufficiently taken into consideration in designs. Often enterprises are built according to outdated designs as a result of which they prove to be technically outmoded by the time they are turned over for use.

Ministries and their expert subdivisions do not always make great demands on the quality and technical level of the designs often permitting a local and departmental approach to solving problems of specialization and intersector cooperation between enterprises especially during their construction as part of industrial centers and also to selecting the capacities and products lists.

A reliable determination of the estimated cost of construction, a careful study of its local conditions and also the features of utilizing the enterprises and structures that are put into operation are not being provided.

The practice has still not died out where, instead of designing and building large and complex projects in phases with starting complexes singled out, designs are worked out and approved that are meant to take many years to bring to fruition. Such designs become morally outdated quickly, the estimated cost of construction loses its reliability and the required capital investments determined in the plan prove to be insufficient to complete it.

The efficient use and reduction in consumption of material, technical, energy and labor resources, protecting the environment, industrializing construction, adopting advanced methods of organizing it and producing work and reducing their labor consumption are not given the attention required in designs.

Working out design and estimate documentation in accordance with the procedure that was in force required long periods of time, large labor expenditures, multiple agreements and approvals at various stages of its preparation and thus hampered efforts to provide construction projects with this documentation on time.

The documentation that was worked out at the design stage and which was taken as the primary documentation--the technical design--is excessively complicated and overloaded with data for solving minor problems and is unnecessarily detailed. Its size reached several hundred volumes and thousands of pages in a number of instances for large national economic projects.

The estimated cost of construction which was determined in detail in fixed prices lost its reliability since the changes that occur due to the effect of scientific and technical progress and the changes in price generating factors over time were not taken into consideration when preparing design and estimate documentation.

The complexity of the existing system of technical norm setting and standardization in design work gives rise to much unfavorable criticism. At present a huge amount of normative documentation is in force which is being continuously added to and made more precise and which, at the same time, reflects scientific and technical achievements and advanced expertise in construction after great delays. It is very difficult to use such a system of documents. In addition, their unnecessary details and at times formalism, inhibit the creative initiative of designers to a certain degree.

The system of planning, estimating and economic stimulation of the activity of design and research organizations has not promoted a reduction in the cost of design and research work and their timetables or an improvement in the quality of design work.

The material and technical base and the technical outfitting of design and research organizations has lagged behind modern demands. Difficulties arise in completely outfitting their highly qualified personnel more and more all the time. It is well known that one does not become a good designer immediately. Special theoretical training, production experience and an aptitude for creative engineering work is required here. Yet at the same time designers have noticeably lagged behind other groups of workers based on wage conditions.

The CPSU Central Committee and USSR Council of Ministers' decree "Concerning Measures for Further Improving Design and Estimate Matters," which is intended to eliminate the deficiencies that were noted above, is based on the abundant experience of recent years that was obtained when designs were being worked out for the most important projects for the national economy, such as the Volga Motor Vehicle Plant, the Kama AZ [Motor Vehicle Plant], Atommash, the Krasnoyarsk Heavy Excavator Plant and many others. Practically all USSR ministries and departments and councils of ministers in union republics and many leading design organizations have taken part in preparing this document.

The decree directs the planning of design and research work and the development of designs toward being more completely coordinated with capital construction plans and the long range outlook for the development and location of sectors of the national economy, industry and production forces. The long range schemes (15 to 20 years) for developing and locating sectors and production forces, which are being worked out by USSR ministries and departments and councils of ministers in union republics on the basis of the primary directions of economic and social growth in the USSR over 10 years and the overall program for scientific, technical and social progress to the year 2000, should serve as the basis when this is being done. These schemes, which are being coordinated by USSR Gosplan and balanced with the country's resources, should contain the required justification and calculations for the primary technical and economic indicators (including the cost of construction), and the enterprises and structures that are planned to be built, expanded or reconstructed. Improving the quality of the composition of the above scheme will make it possible to raise the standard of planning design and research work and create a scientifically valid basis for design work which determines the overall strategy of capital construction in the sectors and regions of the country and its optimum directions and efficiency. Practice has shown that without such studies it is impossible to ensure that each design becomes a necessary link in the overall program for developing the sector and strictly corresponds to the planned technical and economic policy without which it will be impossible to avoid a further increase in the amount of worthless design work.

Formation of the five-year plans for design and research work and the lists of designs that make them up (with an estimate of the needs of capital construction for the current five-year plan and the first years of the following one) and also working them out must now be done directly on the basis of the materials and calculations of the indicators for the planned construction projects that are contained in the schemes. Thus the independent stage of technical and economic justification (TEO) that existed before is excluded.

The quality of the primary document that is to be prepared--Systematic Instructions Concerning the Content, Procedure for Working Out, Coordinating, Approving and Clarifying Schemes for Developing and Locating Sectors of the National Economy and Industry and Schemes for Developing and Locating Production Forces According to Economic Regions and Union Republics for the Next Five-Year Plan--has great importance for realizing the statutes in the CPSU Central Committee and USSR Council of Ministers decree. USSR Gosplan, with participation by USSR Gosstroy, USSR ministries and departments and councils of ministers in union republics, has been charged with working out the instructions in 1981.

The main task that has been placed before designers is to use scientific and technical achievements and advanced native construction expertise in designs to the maximum so that the enterprises that are built and reconstructed are technically advanced by the time they are put into operation and provide manufactured products that are of superior quality with the lowest consumption of labor, raw materials, materials, fuel and energy resources as at the best similar operating enterprises and as is specified by sector standards. In order to meet this goal and improve the effectiveness of capital investments (ways of achieving this goal are precisely determined in the decree) USSR ministries and councils of ministers in union republics have been charged with working out and approving the principal directions for designing enterprises, buildings and structures with top level individual indicators for cost and material consumption by project for the five-year plan and successive one. They have also been charged with specifying goals for utilizing scientific and technical achievements in technology, equipment, building components and materials in the plans for improving the technical level of the sectors.

Goals for the design work that is given to designers should become an important factor in improving quality and the technical and economic standard of design approaches. Ministries and client organizations are obligated to establish appropriate requirements for adopting new techniques and advanced expertise and indicators for the effectiveness of capital investments, the reduction in material and labor consumption in construction and the growth in labor productivity in them on the basis of the sector plans and directions mentioned above.

Thus, the program for ministries and union republics to work on the long range outlook for the technical, economic and social development of the sectors and regions of the country has been defined in the decree on whose quality the further improvement in the scientific and technical level of design work depends in many ways.

The further typification of design approaches on the basis of standardizing spatial planning, structural and technological approaches, units, components and products and also the extensive adoption of typical designs which have been specified has great importance for improving the quality of designs and the growth in the level of industrialization in construction. Along with this ministries and designers are obtaining additional possibilities for working according to typical designs by means of allocations to design and research work for the sector (and not just by the plans for typical design work that were approved by USSR Gosstroy and financed from the state budget).

When erecting certain projects that are identical and have importance for the sector the individual design for building the first one of them must be worked out according to the requirements that are set forth for typical designs. This design must be used repeatedly.

The requirements for the obligatory use of typical designs for repeatedly building primary and auxiliary production buildings and structures, enterprises that have stable production technology over a number of years, housing units, public buildings and structures for agricultural purposes have been increased. It will be permissible to work out an individual design when a typical one is available only with authorization from USSR Gosstroy for large and complicated enterprises, buildings, structures and housing units; with authorization from the USSR Ministry of Agriculture for structures for agricultural purposes; and with authorization from union republic gosstroys for the remaining enterprises, buildings and structures.

USSR Gosstroy together with ministries and union republic gosstroys have to review the typical designs available, regulate their issuance and propagation, revise the all-union catalog of typical building components and products and work out territorial catalogs on the basis of it. All of this work should be directed toward achieving the end results--providing documentation for construction, increasing its level of industrialization, improving quality and efficiency, and reducing the consumption of materials and labor for the projects being built.

A substantial simplification of the design procedure and altering its phase nature on the basis of the aboved-mentioned schemes has the most important significance for improving matters pertaining to providing construction projects with approved design and estimate documentation and eliminating so-called non-designed construction with favorable financing. Designing the primary portion of the construction project will now be done in one stage--a working design is worked out with a summary estimated cost of construction. All technically uncomplicated enterprises, buildings and structures are grouped with such construction projects and also those for which there are typical and repeatedly used designs. When this is done working documentation is drawn up at the same time as the design and is not presented for approval (the design is approved).

Two stages of design work have been established for other projects including large and complex ones: the design with a summary estimated cost of construction and the working documentation (it is prepared after the design is approved). During either of these stages the amount and content of the designed materials that are presented to the panel of experts and for approval should be sharply reduced (by a factor of 2 to 3 on the average).

The practice of working out and reviewing the TEO has shown that the materials that make up this document are on the whole sufficient for evaluating the expediency and correctness of the basic design approaches that are taken by designers and for the panel of experts and departments that are approving the design to make a final decision. USSR Gosstroy is oriented toward this during preparation of the new instructions for design work. The ministries must be guided by this when drawing up sector standards for design and estimate documentation.

It is necessary to place the responsibility for the final form of the entire design on the leading design organizations, naturally, with the payment for their work. Strict measures should be taken in the event of an unjustifiable increase in the amount and contents of the designs that have been established.

The expert subdivisions of the ministries, departments and ispolkoms of soviets of peoples deputies, state oversight agencies and organizations with which design and estimate documentation is coordinated must also strictly adhere to the established requirements for the composition of design materials.

A design organization can work out technological, technical, structural, architectural and other approaches more in detail for individual projects that are especially complicated when preparing working documentation. Several variations of approaches can be worked out on a competition basis when creating typical designs for projects that have important national economic significance and individual designs for complicated projects with the approval of USSR Gosstroy.

The principles for determining the estimated cost of construction, which have been established by a CPSU Central Committee and USSR Council of Ministers decree, require that the rather involved practices that have come about in estimating affairs be reviewed. It is necessary here to single out two trends in the work of ensuring reliability in determining the cost of construction projects and reducing the amount of estimate documentation. First of all the methodology for determining the cost of construction should be substantially simplified. This should be determined, as a rule, on the basis of estimates prepared for typical and repeatedly used economical individual designs, and price lists and cost indicators for similar projects. For this it is necessary to gear up for the accumulation and classification of such indicators in design institutes and also to organize an estimate of the actual cost of the projects that have been built and the results of comparing it to that which was determined in the designs, and to organize the extensive exchange of this information. Secondly, a prognostic evaluation of the effect of scientific, technical and social progress on the cost of construction, the dynamics of prices on equipment, building components and materials, changes in demand for the quality of a product, price generating conditions and others should be considered in the summary estimated calculations by construction project by using a substantial period of time.

A method for working out and using appropriate correction coefficients has been prepared and tested in practice by USSR Gosstroy with a number of other ministries taking part. It is already necessary for ministries to set about determining them now.

Special attention should be given to the fact that now the estimated cost must be approved as the limit for the entire period of construction and errors in determining it will be regarded as a breach of state discipline.

Price lists for construction will be used for settlements between clients and contractors for the finished construction product and where there are none--estimates drawn up from working drawings. This will serve as a reliable basis for developing cost accounting relationships in construction.

Complete clarity has been introduced for problems of coordinating design and estimate documentation with organizations whose interests are affected including contractors and state oversight agencies. The time limits for reviewing and coordinating it have been established. If a decision is not made during the course of time set aside for this, the designs can be approved without coordination. Without a doubt, such a measure will force all the departments that take part in coordinating and approving design documentation to review the principles of their work which have taken form by which long months of designers' time have gone toward coordinating designs and estimates.

In accordance with the decree USSR Gosstroy is working out a single system for co-ordinating designs. According to it, in which all the established requirements, norms and regulations for design work and construction are observed (and this is especially attested to by the chief engineer having full responsibility for the design) designs will not be coordinated with state oversight agencies but, when coordination is required--only with one department of a given agency.

In accordance with the CPSU Central Committee and USSR Council of Ministers decree and the functions that have been entrusted to USSR Gosstroy for supervising the methods in design and estimate matters and engineering research for capital construction, it is reviewing the entire standard instruction basis of design work jointly with ministries and departments. This work should be basically completed in 1981.

Overall measures have been specified in the decree for creating conditions that will make it possible to enlist structural engineering organizations of machine building ministries in working out designs by using new unique special equipment. This will make it possible to essentially reduce the timetables for creating and delivering equipment to construction sites, to use more reliable data on equipment as a basis especially during design work for heavy industry enterprises and to, thus, eliminate revisions in approved design approaches during the working design and the process of construction.

A goal has been set to substantially improve engineering information concerning achievements in native and foreign science and techniques in the field of production technology, means of mechanizing and automating work, managing production and technological processes, and advanced methods of construction which are needed for design work. Evidently, we must go the way of creating a special system that includes bringing in information, its purposeful selection, publication and distribution to each design organization.

While requiring designers to create designs that answer the problems not only of today but also of tomorrow they need to be armed with information concerning the arsenal of means that the national economy has at its disposal. Therefore, it is difficult to overestimate the importance of the resolution that has been approved concerning the formation of an All-Union Information Center About Equipment in the GKNT [State Committee for Science and Technology] system. State registration and an estimate of equipment which is being turned out, is scheduled to be turned out and which is being removed from production, the preparation of information about it and an inquiry-information service in organizations have been imposed as its responsibilities.

The role of union republic gosstroys is being increased in conducting a uniform technical policy in construction, improving the architectural appearance of cities, industrial centers and villages, and improving the quality of constructing and designing enterprises, buildings and structures.

Territorial design organizations will begin to play a more noticeable role in solving the problems associated with the development of territorial production complexes, industrial centers and individual enterprises.

The measures being taken will promote design approaches that are more closely coordinated with the economic and social development of the regions of the country, rational and efficient use of local resources and consideration of local features in designs.

A system of head and territorial research organizations is scheduled to be formed with the goal of improving engineering research for capital construction. Their activities will be regulated by a special statute.

The rights of USSR ministries and departments and councils of ministers in union republics have been substantially broadened for solving many problems in design work and to reduce its duration, improve efforts to provide construction sites with design and estimate documentation and to efficiently use resources in every way possible. In particular, they have been given the right to independently approve title lists for design and research work for projects having a cost of three million rubles or more which are included in the lists of designs that are being worked out and approved as part of the five-year plans for design and research work. Under the previous system two to three extra years (when considering working out the TEO) went toward approving these title lists and sometimes even more.

Solutions to many other urgent problems in the production and management activities of design and research organizations have been specified in the decree which takes into consideration the resolutions in the CPSU Central Committee and USSR Council of Ministers decree "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality." Thus, planning profits and wages is being regulated, a conversion to concluding single contracts for the entire design period with uninterrupted financing for the work has been specified, the procedure for clients to settle accounts with design and research organizations for completely finished designs has been defined more precisely, requirements have been established for evaluating the activity of design and research organizations by considering the above accounting system and others.

The possibilities have expanded for service field trips for designers associated with the collection of initial data and materials for research and design work and with inspections of operating enterprises, buildings and structures which must be reconstructed, expanded or technically reoutfitted, and for field trips associated with the supervision of construction by the author, rendering technical assistance to enterprises, construction sites and design organizations, developing working drawings directly at construction sites, filling out orders for equipment and coordinating the conditions for its delivery with enterprises.

All of the measures specified in the decree will serve as a realistic basis for clients of design work, design and research organizations and their supervisors to bear stricter responsibility for the technical and economic indicators of the projects being designed, the quality of the designs, the correct determination of the estimated cost and sequence of construction, and for working out the design and estimate documentation that is given to the contract organization on time and in its entirety.

Reinforcing material incentives for designers to create high quality designs will serve to ensure high technical and economic standards in designs. Material incentives will be made directly dependent on the use of scientific and technical achievements to meet the goals for improving the effectiveness of capital investments, and reducing material and labor consumption in construction.

While making great demands on designers the CPSU Central Committee and USSR Council of Ministers have shown much concern for improving wages and working conditions developing a material and technical base for design and research organizations and for outfitting them with modern equipment and means of mechanizing and automating work. Planning agencies, industrial ministries and material and technical supply agencies have received corresponding tasks. All ministries have been charged with specifying special purpose means that are to be allocated toward constructing and expanding buildings for design and research organizations in the plans beginning with the 11th Five-Year Plan. Their workers should already be accommodated during this five-year plan in accordance with the regulations in force.

The solution to these problems will now be specified in special plans for the development of a network of and material and technical base for design and research organizations. The necessity of substantially reducing expenditures for design work as a result of simplifying its procedures and number of stages, creating an economic base for planning design and research work--schemes for developing and locating sectors and production forces--and also reducing the amount of design and estimate documentation should be kept in mind when forming these plans.

When planning the network of design and research organizations it is necessary to regulate it, eliminate small organizations and those that have poor qualifications or are duplicating other operations. A huge mass of groups, bureaus, departments and other subdivisions have been bred in recent years that function as part of various enterprises and organizations and have nothing in common with design work. Designs that are worked out by the majority of these subdivisions by means of general activity funds, cannot as a rule, withstand any criticism. USSR ministries and councils of ministers in union republics are also called upon to give attention to this.

An important role in implementing the requirements in the CPSU Central Committee and USSR Council of Ministers decree concerning an improvement in design and estimate matters belongs to the expert subdivisions in ministries, departments, and ispolkoms of soviets of peoples deputies. One could not say that, in organizing their work, everything is proceeding favorably or that the quality meets modern requirements despite all of the measures being taken. In this regard USSR Gosstroy, GKNT and the USSR State Committee on Prices are preparing suggestions about further improving the activity of expert agencies in order to increase their role in ensuring a high scientific and technical standard and economy in the designs that are being worked out.

The CPSU Central Committee and USSR Council of Ministers decree concerning a further improvement in design and estimate matters, which has set new, more complicated tasks for designers, extensively and completely encompasses all the problems in this important link of capital construction. Implementing the measures that have been specified by the decree will become a new stage in developing and improving design work. This requires great strenuous, inspired work, applying all efforts toward unconditionally completing that which is planned and solving the important problems that were placed before capital construction by the 26th CPSU Congress.

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CHEMICAL HARDENING PROCESS FOR FOUNDATIONS DESCRIBED

Tashkent STROITEL'STVO I ARKHITEKTURA UZBEKISTANA in Russian No 8, Aug 81 (signed to press 11 Aug 81) pp 11-13

[Article by Engineer G. A. Avdeyeva, SAF of Scientific Research Institute of Foundations and Underground Structures, Candidate of Technical Sciences M. N. Ibragimov, NIIOSP, and Engineer I. N. Bondarenko, State All-Union Trust for the Reinforcement of Foundations and Structures of Glavgidroenergostroy]

[Text] Buildings and structures erected on sagging loessy soils frequently undergo considerable deformations as a result of emergency wetting of the soils at their foundation. Protecting these buildings against total collapse is the most important national economic problem which can be solved by using chemical hardening of soils at the foundations. The experience of successful use of chemical hardening of soils at the foundation of the editorial-publishing building (RIK) in Dushanbe is described in the article.

The RIK building is a five-story type measuring 12.5 X 105 meters, the footings are continuous and their depth is nonuniform: 2 meters in the north wing and about 6 meters in the middle part and the southern wing where the basement rooms are located. It is separated into three sections by expansion seams. It was constructed in 1975 by the design of the Leningrad Branch of the Institute GipronIIpoligraf [expansion unknown]. Sagged loess-like sandy loams are deposited to a depth of 18-20 meters at the base of the structures. According to data of TadzhikGIINTIZ [expansion unknown], which conducted engineering and geological surveys in 1972, the loess-like sandy loams of the section are distinguished by nonuniform density and moisture content. The soil density fluctuates from 1.42 to 1.8 t/m<sup>3</sup> in depth. The lower layers have higher density. The moisture content of the soil varies from 12.7 to 26 per cent. Increased moisture content is observed at a depth of 7-9 meters from the surface. Ground waters in the loessy soils were not detected by drilling. Before laying the footings of the building, the soil under it was packed by heavy tamping.

Considerable nonuniform sagging occurred even before the building was put into operation. During the first year of operation, according to data of instrument observations of TadzhikGIINTIZ, settling of the northern part of the building was 180 mm and that of the southern part was 14 mm. Cracks appeared in the walls and supporting structures of the building. Nonuniform settling subsequently began to become progressive. Thus, in 1977 settling of the northern part comprised 34 mm during May alone as a result of emergency wetting of the foundation soils, which led to considerable deformations to the building.

In 1976 experimental work was conducted by the Scientific Research Institute of Foundations and Underground Structures imeni N. M. Gersevanov, jointly with the Central Asian Branch of this institute, to reinforce the soils of the foundation of the RIK and the Poligrafkombinat /Printing combine/. It was suggested that the soils at the base of the footings be strengthened by gas silification to stop the development of deformations. Selection of this method of reinforcement was determined by the fact that the soils at the foundation of the building are slightly active (the absorption capacity comprises on the order of 10 mg/eqv per 100 grams of dry soil in a single-normal alkaline solution of NaOH), with increased moisture content in some sections. The use of ordinary silification could be inadequately effective.

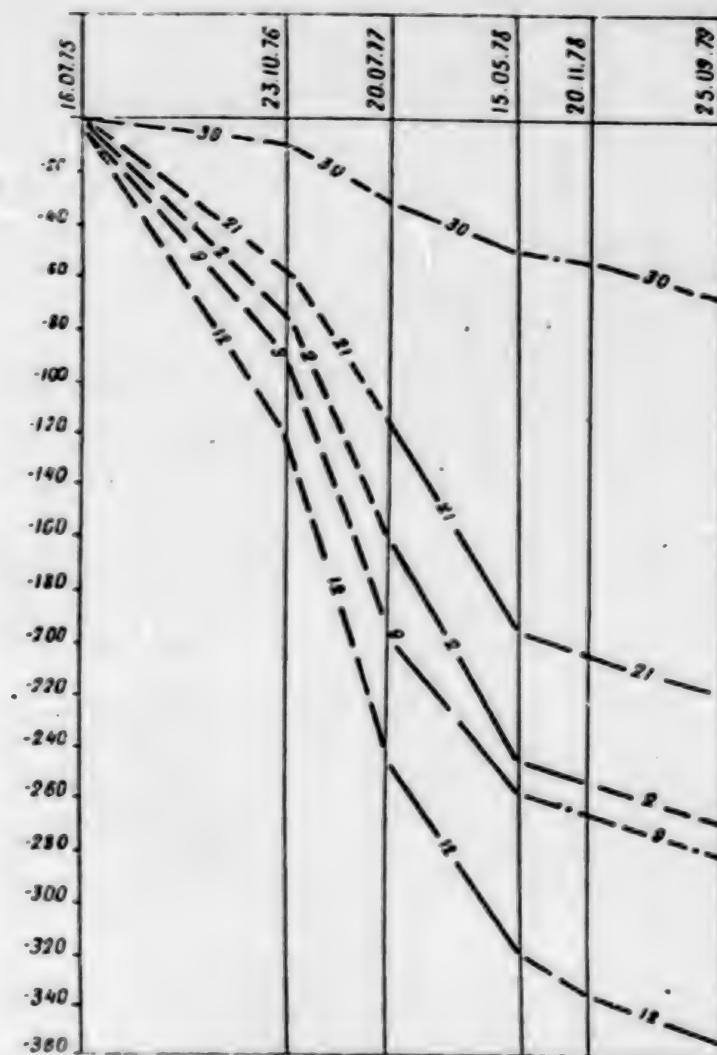
The essence of gas silification consists in the following: carbon dioxide and then a silicate solution and again carbon dioxide are first forced into the soil by an injector or through a borehole. Preliminary forcing of the carbon dioxide chemically activates the soil and at the same time contributes to better penetration of the silicate solution into the mass as a result of partial expulsion of the pore water from the zone adjacent to the injector (borehole). The silicate solution then hardens with subsequent injection of the carbon dioxide, as a result of which the soil is transformed into rock-like material that is not wettable in water. Its uniaxial compressive strength reaches 10-15 kgf/cm<sup>2</sup>.

Based on recommendations of NIIOSP, the Gidrospetsproyekt of Minenergo [Ministry of Power and Electrification] of the USSR worked out a plan for chemical strengthening of soils under the footings of the RIK building (the chief engineer of the project was V. V. Torgashov). The work was carried out according to the project by the Tajik SU [Construction Administration] of the All-Union Association, Gidrosstroy, Minenergo of the USSR.

Work was conducted on cementation prior to chemical strengthening of the soils so as to fill the cavities under the footings and thus to eliminate possible seepage of the silicate solution through them when it was injected into the soil. Cementation was carried out with nonsagging cement mortar with V/Ts = 0.7 and with addition of 6 percent bentonite clay by mass. The density of the mortar was 1.65 t/m<sup>3</sup>, and running along the AzNII cone was 22-24 cm. The uniaxial compressive strength of the hardened rock was 100-140 kgf/cm<sup>2</sup> after 28 days.

A number of sloping boreholes 105 mm in diameter, directed toward the center of the base, was drilled in the footings by an NKR-100 drilling machine to inject the cement mortar. The distance between boreholes was 2 meters. The mortar was injected into the borehole by an NGR 250/50 pump through an open pump installed at the mouth. The cavities of the base and the footing itself was made one piece simultaneously when the plug was installed in the mouth of the hole. The injection pressure did not exceed 2 kgf/cm<sup>2</sup>. A total of 510 m<sup>3</sup> of cement mortar was pumped through 142 boreholes.

The soils under the footings were hardened according to the following process flow diagram. Metal pipes 42 mm in diameter, so-called injectors consisting of individual sections 1 meter long each, joined to each other by a threaded connection, were driven into the soil to the planned depth every 1.5 meters along the footings on



Vertical Movements of Settling Marks: --- --settling of marks prior to work; —— --period of conducting work; --- --vertical movements of marks after completion of silification work

both sides of the walls. The lower section of the injector 2 meters long has a perforation: openings 2 mm in diameter uniformly arranged on the surface through which the reagent to be pumped in penetrates the soil. Holes 105 mm in diameter were first drilled (with the NKR-100 drilling machine) to facilitate penetration of the injector through the concrete floor inside the building or through the gravel-asphalt fill outside the building. The injectors were driven with a KBU-50 machine and were removed by hydraulic jacks with capacity of 10 tons.

The reagents were injected into the soil "in passes" 2 meters deep each by an ascending scheme, beginning with the lower zone and sequentially moving upward. There was an average of five passes in each borehole. A total of 9.4 kg each of carbon dioxide was sequentially injected into each pass for preliminary activation of the soil and then 1,400 liters of the silicate solution with density of  $1.13 \text{ g/cm}^3$  was injected and again 16 kg of carbon dioxide was injected. The approximate volume of

the reinforced soil comprised 4 m<sup>3</sup> from the "pass" with calculated radius of 0.8 meter. The carbon dioxide was pumped from tanks through a gas reducer at pressure of not more than 2 kgf/cm<sup>2</sup> to activate the soil and at pressure of not more than 3 kgf/cm<sup>2</sup> to harden the silicate solution. The gas flow rate was measured by the weight method using floor scales. Twelve-volt electric heaters of the design office of introduction of the Rostov PromstroyNIIproyekt [expansion unknown] were used to prevent the reducer freezing up during prolonged passage of gas through it. The silicate solution was pumped in working concentration into the boreholes by an ND 1000/10 pump at pressure up to 3 kgf/cm<sup>2</sup> with flow rate up to 16 liters/min. The solution was fed from a mortar unit to the location of injection. The pumps were installed in the immediate vicinity from the section. The silicate solution was prepared in working concentration (1.13 kgf/cm<sup>2</sup>) in the mortar assembly equipped with two tanks of 25 cm<sup>3</sup> each and with a GR 240/50 pump. One tank, installed on the surface of the soil, was designed to store the concentrated solution. The second, installed on a trestle, was designed to prepare the working solution 1.13 g/cm<sup>3</sup> in density and the sediment.

A total of 7,624 m<sup>3</sup> of soil was reinforced over a period of 10 months under the RIK building. The quality of reinforcing the soil was checked in two directions: 1-- by opening holes on the completed sections with samples, by visual estimate of the nature and volume of hardening and by laboratory tests of the hardened soil and 2-- by instrument observation of settling of the building both during the work and after its completion. Three holes were opened to a depth up to 8 meters during the work, as a result of which it was established that the nature and volumes of hardening and the quality of the hardened soil meet the design requirements.

One of the indicators of the quality of reinforcement is development of settling of building footings (figure). Comparison of the results of geodetic observations before beginning the reinforcing work, during the work and after the work was completed indicates a significant reduction of the rate of settling. Moreover, it is obvious from the figure that settling is nonuniform in nature before and during reinforcement. The greatest rate of settling is observed in the northern part of the building (marks 2.9 and 12) and the lowest rate is observed in the southern part (mark 30). The entire building settles uniformly after completion of the silification work. The continuation of slight settling is explained by consolidation of the underlying, unreinforced layers of soil and by redistribution of stress. Complete stabilization of settling is expected after a certain time.

Work is now continuing in Dushanbe to reinforce the soils of the foundation of the production building of Poligrafkombinat.

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DEPUTY MINISTER GOSPLAN DISCUSSES MACHINE BUILDING INDUSTRY

Moscow TRUD in Russian 23 Oct 81 p 2

[Article by N. Ryzhkov, first deputy chairman of USSR Gosplan: "For the Honor of the Soviet Trademark"]

[Text] Machine building is the heart of industry. We have the right to be proud that many of the most complex units bearing the trademark "Made in the USSR" have no comparison in the world. During the past five-year plan, for example, a unique "250" mill for manufacturing railroad car axles was put into use. A mill for the continuous production of 1,200 meters of welded pipes per minute was put into operation at the Taganrog metallurgical plant--there is no such operating rate for any similar unit in the world. Soviet workers and specialists have installed a gigantic press with an output of 65,000 tons in the city of Issoire in France.

During the 10th Five-Year Plan hundreds of licenses were sold to foreign firms for the best Soviet machines, equipment and technological processes. On the whole production volume in machine building and metal working grew by 48 percent during the last five-year plan. The output of such types of products as powerful presses, precision machine tools, excavators and bulldozers, motor vehicles, and devices and means of automation, which are so badly needed for our economy, increased substantially. During the 10th Five-Year Plan atomic machine building, which has been called upon to provide a rapid increase in power for the country, was practically formed anew.

As we see the successes are undeniable. But it would be incorrect not to also see the serious problems which stand before native machine building today. This is in reference most of all to the quality of the products that are turned out, their state of the art and ability to compete in the foreign market. These problems were and remain urgent. During the past year the USSR State Committee for Science and Technology and USSR Gosplan conducted an evaluation of the technical level of the products that are being turned out. About 20,000 brands of articles were tested and here is the result: 29 percent of these products need to be modernized or removed from production altogether.

The rates of developing new types of products are declining. At the end of the last five-year plan new products amounted to 2.5 percent of all of the machine building versus 4.3 percent in 1970. As a result the relative proportion of outmoded machines and equipment remains high. Let's look, for example, at what the proportion is of

the products that are turned out at enterprises for more than 10 years. Over the past decade it increased from 20 to 28 percent. The timetables for renewing products are approaching their economically valid limits and this is impeding an improvement in the efficiency of all social production.

Some backwardness is evident in the technical level of a number of types of products that are being turned out compared to similar foreign products.

And so, the technology is becoming outmoded and this is hampering the growth in labor productivity and the rates of developing our economy. What are the reasons then for such a phenomenon? To put it succinctly—the proper responsibility still does not exist on the part of enterprises to remove outmoded technology from production on time while the economic sanctions exacted from such enterprises are not sufficient.

We will try to interpret this. When an enterprise obtains new technology it very often does not willingly part with the old. The machine tool still operates, it may prove useful—why send it off somewhere? But this is an unqualified non-engineering approach. For it is perfectly clear: outmoded equipment is dead weight. It even happens that a plant does not attempt to acquire new technology at all: for any reorganization is associated with a temporary decline in the economic indicators, additional resources, and troubles.... It is easier to live according to the old ways. And no one seriously asks plant administrators or the ministry about the rates of modernizing technology. This matter was, in essence, allowed to take its own course.

They can answer me: but the ministry itself is economically interested in improving the quality of products. At present, as is well known, there are three classes of quality: superior, first and second. And so economic sanctions are specified for products in the second class of quality the output of which is not suitable either for a plant or the sector as a whole. But the fact of the matter is that while sanctions exist there are practically no products in the second class of quality. Therefore sanctions are not proving to have a significant effect on a plant's economic indicators.

It would seem that one should be happy that we have few products in the second class of quality. But in reality there is not such a small amount of outmoded technology at all as it appears from the records. It comes down to artificially overstating the class and deficiencies in the system of controlling the technical level and quality of the product being turned out.

According to the existing system certification of the machine building product as being in the superior class of quality is done by a state certification commission. It is made up of representatives of the client, the State Committee for Standards, the Ministry of Foreign Trade and other organizations. This interdepartmental commission can objectively evaluate the technical level of a machine tool or machine. And yet certification of the first and second class is done by sector commissions. They are made up of specialists from all-union industrial associations or main administrations, that is, people who are directly interested in sector products having a higher class of quality. This is understandable: when second class products are produced the profits of enterprises are reduced and often transferred to the budget. Therefore, the second class of quality has practically disappeared in our industry.

The status of affairs with the output of new machine building products urgently requires fundamental changes in the standard official documents in force. This relates first of all to the system of certification, control over developing, mastering and producing new machines and also the timely removal of them from production. New standard official documents must significantly affect the economic indicators of enterprises. Plants that turn out advanced technology should be encouraged to produce new and often more labor consuming products. They must have priority when determining the end results of work.

It seems that certification of the first and second class of quality should be done by state commissions. Their evaluations will be objective. At the same time it is necessary to improve the quality of the standards themselves. They must completely conform to the best examples in the world.

What still needs to be done to change the situation of accelerating the modernization of technology? Beginning with 1982 USSR Gosplan will plan for the ministries to remove outmoded equipment, machines and machine tools from production and to turn out new ones. I will emphasize this--it will be according to a specific products list.

The problems of renovating the technology for the tractor and agricultural machine building, construction, road and municipal and also heavy and transportation machine building and a number of other ministries are especially urgent. The relative proportion of products that have been produced for more than 10 years is high here.

Examples can be given where this equipment is morally outmoded and has unjustifiably heavy weight. Several native forging and pressing machines and individual models of motor vehicles and tractors, cisterns, equipment for the food and light industry and diesel engines are heavier than similar foreign products....

The consumption of fuel and oil per unit of power is high for the majority of internal combustion engines. Losses of electricity in electrical metallurgy and the aluminum industry are still great due to the imperfection of machines and equipment. If 65 percent of the trucks and 20 percent of the automobiles were converted to diesel this would make it possible to reduce the annual consumption of fuel (when making a conditional evaluation) of approximately 10 million tons.

When speaking about modernizing technology it is impossible not to touch upon the basic question whether or not it is sufficiently available to satisfy the sectors' demand for it. Today the national economic demand for large power and electrothermal equipment, certain trucks, many types of agricultural technology and other machines is practically being completely satisfied.

However, as before there are difficulties in providing the national economy with rolling, chemical and hoisting-transporting equipment and mechanized construction tools. Special metal working equipment, certain highly productive construction machines and especially equipment for the food and light industry are also insufficient. The national economy is provided with 80 to 85 percent of this technology.

In recent years a serious lag in the output of modern heavy mining transport technology was projected. The reason is because the Cheboksary heavy tractor plant has not been able to work out a base model for a 330 horsepower industrial tractor over

the course of a long period of time. The existing model has a low level of dependability, a high consumption of metal, etc. As a result up to now the mining industry does not have a modern native heavy bulldozer. The series output of dump trucks with a load lifting capacity of 110 and 180 tons is lagging behind. And the features of the 75 ton dump trucks that are being produced in small amounts are inferior to the best foreign models. Few shovel excavators with a bucket capacity of 12.5 and 20 cubic meters are being turned out. The mining industry is also not being provided with SBSH-320 type boring machine tools. As a result enterprises in the USSR Ministry of Ferrous Metallurgy did not meet the goals for stripping work by 250 million cubic meters during the past five-year plan. This lag must be made up in a shortened period of time.

Large tasks have been placed before machine builders during the current five-year plan. The output of products will increase by no less than a factor of 1.4. At the same time the structural organization will become more flexible and receptive to technical innovations and discoveries that are capable of bringing about real revolutionary changes in production. The proportion of products in the superior class of quality will also increase by a factor of approximately 1.4. And technological productivity will grow by a factor of 1.5 and in a number of cases by 2.5.

There is no doubt that the technical level of our machines, machine tools, and equipment will be raised to a new, higher level during this five-year plan. We must really fight for the honor of the Soviet brand.

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## METALWORKING EQUIPMENT

### WORK OF MACHINE TOOL, TOOLBUILDING MINISTRIES EXAMINED

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 81 p 4

[Article: "Machine Building--Up to the Level of New Tasks: At the Standing Commissions of the Chambers of the USSR Supreme Soviet"]

[Text] A few days ago a joint session of the Union Council and the Council of Nationalities Commission on Industry met. The work of the Ministry of the Machine Tool and Tool Building Industry and the Ministry of Heavy and Transport Machine Building was examined in regard to fulfilling the quotas for creation of the growth of labor productivity in industry.

Machine tool building has a key role in elevating the technical level of machine building and, in the final analysis, of technical progress and the growth of labor productivity in the national economy. Heavy machine building, which manufactures equipment for a number of basic sectors of the economy, also exerts a great influence on the intensification of production and in increasing labor productivity.

The speaker, the chairman of the joint deputy subcommission N. I. Ryzhkov, Ministers B. V. Bal'mont and V. F. Zhigalin and deputies who spoke at the session noted that in both sectors specific work had been done in recent years to insure fulfillment of plan quotas associated with the creation of levels for improving labor productivity in industry.

The rate of development for building production outstripped the growth rate for by a factor of 2, thereby creating the necessary requisites for realization of mechanization and automation of production processes, which were advanced by the 26th Party Congress, and for reduction of the share for labor-intensive manual operations.

Moreover, at the sessions the primary attention of the Minstankoprom [Ministry of the Machine Tool and Tool Building Industry] and Mintyazhmash [Ministry of Heavy and Transport Machine Building] was directed toward elimination of shortcomings which are present in the industries' operation. They do not fully utilize existing reserves for improving production efficiency nor satisfy the national economy's growing requirements for modern forms of equipment.

The development of interindustrial specialization and cooperation in machine building was subject to detailed scrutiny. Coordination of operations for carrying out a unified technical policy in the area of centralized production for general machine building applications has been imposed on the Minstankoprom. It is performing the role entrusted to it poorly.

The advantages of the new management structure are not being completely utilized in either sector toward the goals of improving production efficiency and work quality. There are production associations formed by mechanically merging plants without an in-depth study of the economic bases for their creation and developmental prospects. The Minstankoprom and Mintyazhmash are inadequately concerned with improving the organization of socialist competition and with the utilization of such an efficient form of mobilizing workers to accelerated rates of production growth as counter-planning [vstrechnoye planirovaniye].

The commission adopted recommendations directed at improving the operation of these sectors of machine building.

V. V. Kuznetsov, candidate for membership in the CPSU CC Politburo and first deputy chairman of the Presidium of the USSR Supreme Soviet and P. G. Gilashvili, deputy chairman of the Presidium of the USSR Supreme Soviet, participated in the session.

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## METALWORKING EQUIPMENT

### EFFICIENCY OF NPC MACHINES AT GOMEL' MACHINE TOOL BUILDING PLANT IMENI S. M. KIROV

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 9, Sep 81 (signed to press 18 Aug 81)  
pp 38-40

[Article by L. Sel'kina, economist at Gomel' Machinebuilding Plant imeni S. M. Kirov, and Doctor of Economic Sciences S. Kim, head of the chair of branch economies at Gomel' State University: "Important Condition for Improving Production Efficiency"]

[Text] Stressing the importance of the efficient use of production capacities, Comrade L. I. Brezhnev said in the Accountability Report at the 26th CPSU Congress, "The improved use of production capacities -- machinery, equipment and means of transport -- opens up great opportunities. Reducing idle time, improving the shift index and developing flow charts which save energy and materials -- this is what we must concentrate our efforts on." One direction in which this problem is being solved is in revealing and eliminating, as well as forestalling, disproportions in enterprise subdivisions and the continued proportional development of all fixed production asset elements. By actualizing it, we can ensure smooth operation, obtain additional output with the same capital investment, and increase enterprise profitability.

Inasmuch as production is dynamic, no matter how perfectly proportions between enterprise subdivisions might have been set up at one time, they still will be continuously changed. These changes are generally a result of production growth and development. If consideration is given to the fact that machinebuilding output changes an average of once every 4-5 years, then over the average service life of a machine tool, which is 27 years according to ENIMS [Experimental Scientific Research Institute of Machine Tools] data, the output processed on it changes an average of five times. In this regard, the enterprise complement of machine tools is relatively inertial compared to the dynamicity of the output. Under these conditions, there also arises a volumetric lack of conformity of the technological equipment to the machinetool-intensiveness structure of the output being manufactured. This entails disproportions in production capacities and an uneven and consequently low load on equipment.

The noncorrespondence of the throughput capacity of individual groups of equipment, production sectors and shops also occurs when more highly-productive equipment is incorporated into one technological stream to replace worn-out equipment. For example, enterprises have begun using NPC [numerical preset control] machines extensively in recent years. Whereas NPC machine tools comprised 2.8 percent of the machines at Gomel's Machine Tool Building Plant imeni S. M. Kirov in 1975, that proportion was 9.4 percent in 1980. During the assimilation period, NPC machines are not at designed productivity. For that reason, they initially do not disturb the efficient proportions

among related types of equipment. Subsequently, in order to bring the productivity of these machine tools up to specifications, we need to work out optimum programs, introduce multiple-machine servicing and create special sectors (see Table 1).

Table 1.

| Indicator  | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|--|------|------|------|------|------|------|
| proportion of NPC machine tools in the total number of machine tools | 2.8  | 3.9  | 3.8  | 4.5  | 7.1  | 9.4  |
| proportion of work done using NPC machine tools                      | 0.7  | 2.7  | 3.4  | 4.7  | 7.6  | 8.5  |
| (in percent)   |      |      |      |      |      |      |

The data given in this table indicate the necessity of constantly analyzing the proportionality which is evolving among groups of equipment, sectors and shops. Such analysis enables us first of all to reveal excess equipment and to promptly prevent and eliminate disproportions in the machine-tool equipment structure.

Improved accessories, changes in the technological process, the use of new materials and so on, also disrupt the established proportions. All this can, if the necessary steps are not taken ahead of time, lead to a reduction in output and to a low production capacity use factor.

In order to avoid this, Gomel' Machine Tool Building Plant imeni S. M. Kirov has taken some steps, some results of which are as follows. Whereas in 1975, with equipment at 55.1 percent of total fixed assets value, the production capacity use factor was 0.96, while in 1980, these indicators were 53.4 percent and 0.99. In this regard, output per machine tool increased 30.3 percent. The plant achieved these results thanks to the introduction of a comprehensive quality control system and the implementation of a number of organizational-economic measures which ensured the proportionality of individual subdivisions.

Ensuring proportionality of production capacities meant analyzing the production program and specializing subdivisions; analyzing factors influencing production capacity use and considering the work specifics of each subdivision (technical, organizational and social); long-range normative production capacity calculations for subdivisions, calculating anticipated equipment loads and shift indexes; working out organizational-technical measures to help exclude disproportions in the production capacities of individual subdivisions and determining optimum subdivision production programs; operational-production recording of equipment operation; analyzing and evaluating actual subdivision production capacity use.

It is easy to see that particular attention was paid to long-range calculations and steps ensuring the proportionality of individual sectors and technological operations. Thus, for example, the anticipated structure of the machinetool-intensiveness of output to be produced at the end of the 11th Five-Year Plan was fully calculated prior to compilation of the long-range 1981-1985 plan. Typically, these calculations were made in a dynamic, to reveal deviations in capacity proportionality (see Table 2, following page).

It is evident from the table that the ratios of numbers of technological operations are very dynamic with change in the output products list. Whereas milling operations

Table 2.

| Technological operation | operation as a percentage of total output machinetool-intensiveness |       |       |       |
|-------------------------|---|-------|-------|-------|
|                         | 1970  | 1975  | 1980  | 1985  |
| boring and turning      | 1.5   | 1.2   | 1.7   | 1.0   |
| lathework               | 34.1  | 34.9  | 35.2  | 28.4  |
| reaming                 | 12.7  | 6.3   | 13.5  | 15.4  |
| grinding                | 12.6  | 20.6  | 11.3  | 12.2  |
| milling                 | 9.6   | 13.6  | 13.6  | 17.4  |
| planing                 | 13.8  | 9.1   | 9.3   | 12.5  |
| drilling                | 8.9   | 9.3   | 9.5   | 9.8   |
| gear cutting            | 5.2   | 4.4   | 3.7   | 2.0   |
| broaching               | 0.7   | 0.3   | 0.4   | 0.1   |
| slotting                | 0.4   | 0.3   | 0.3   | 0.3   |
| cutting                 | 0.5   | --    | 1.5   | 0.9   |
| total                   | 100.0   | 100.0 | 100.0 | 100.0 |

comprised 9.6 percent of total output machinetool-intensiveness in 1970, they will have nearly doubled by 1985. But the proportion of other operations, such as boring and turning and gear cutting, in the overall machinetool-intensiveness of the program will have decreased nearly two-fold by 1985. These calculations enable us to take the necessary steps to prevent anticipated disproportions in production subdivisions in advance by changing the composition of the technological equipment complement at the right time, bringing labor-intensiveness and the structure of the machine tools into line with one another.

At present, the plant is working out an enterprise standard for subdivision smoothness of operation which includes individual provisions of the production capacity control system. An optimum production program based on a normative use factor for them has already been worked out. It takes into account the availability of complete sets of technological equipment, progressive forms of labor organization and production technology, equipment productivity, percentage output norm fulfillment by leading workers (by equipment group), planned equipment operation time and reduced output machinetool-intensiveness through a plan of organizational-technical measures. Calculating subdivision production capacity this way enables us to reveal excess or low-load equipment and how to best load that equipment given the existing strict specialization of the subdivisions.

All the needed calculations can be done quite efficiently by computer at the plant's cluster computer center (KVTs). Here, the load is calculated for each piece of equipment, enabling us to see technological equipment reserves even when drawing up the subdivision plan and to use them in intraplant and interplant cooperation. This simplifies both operational-production accounting and analysis of actual equipment use. In order to ensure proportionality and determine opportunities for increasing production, an economic-mathematical problem such as the following is often solved for each subdivision at the plan development stage or when individual production parameters are changed. Say we need to find possible output volumes by type of item in which the technological equipment resources are used in the best manner.

Let's introduce the following designations:  $a_i$  is the number of units of technological equipment in the  $i$ -th group ( $i=1, 2, \dots, n$ ),  $b_j$  is production volume for the  $j$ -th type of item ( $j=1, 2, \dots, m$ ),  $t_{ij}$  is the labor-intensiveness of manufacturing a unit of output of the  $j$ -th type for the  $i$ -th technological equipment group,  $x_{ij}$  is the number of units of technological equipment of the  $i$ -th type assigned to the  $j$ -th type of items being produced ( $i=1, 2, \dots, n$ ;  $j=1, 2, \dots, m$ ) and  $y_k$  is the time reserve for the  $k$ -th equipment group ( $k=1, 2, \dots, n$ ). In order to determine unknowns  $x_{ij}$  ( $i=1, 2, \dots, n$ ;  $j=1, 2, \dots, m$ ) with consideration of an even load on technological equipment, we solve  $n$  systems of linear equations:

$$\begin{aligned} x_{i1} + x_{i2} + \dots + x_{im} &= a_i \\ t_{i1}x_{i2} - t_{i2}x_{i1} &= 0 \quad (i=1, 2, \dots, n) \\ t_{i3}x_{i2} - t_{i2}x_{i3} &= 0 \\ \dots \dots \dots \\ t_{im}x_{i,m-1} - t_{i,m-1}x_{im} &= 0 \end{aligned}$$

Time reserve  $y_k$  ( $k=1, 2, \dots, n$ ) is found for the  $k$ -th technological equipment group using formula

$$y_k = 4015 a_k - \sum_{j=1}^m b_j t_{kj} \quad (k=1, 2, \dots, n)$$

where 4015 hours is the annual operating time for one unit of technological equipment.

In order to use the available equipment time reserve, we adjust the assigned plan so that the time reserve for each equipment group approaches zero or the load coefficient approaches 1. In order to calculate the supplemental plan, we find the following

value  $\max_j \left( \min_i \frac{y_i}{t_{ij}} \right)$ , which is used for the new supplemental plan for the  $j$ -th group

of items; we then recalculate the time reserve for each type of equipment.

Daily management of the current production process must find reflection in a smooth-running system of ensuring proportionality of production capacities, which is one element in the comprehensive system for increasing its efficiency.

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METALWORKING EQUIPMENT

NEW NUMERICALLY CONTROLLED MACHINE TOOL DESCRIBED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Nov 81 p 2

[Article by Yu. Mikhalyuk: "New Multi-Operation Numerically Control Machine Tool"]

[Text] The new numerically controlled machine tool which has gone into production at the Odessa Precision Machine Tool Plant is a three-in-one unit combining the performance of a milling machine, a boring machine and a drill. It is equipped with a fast action manipulator for changing more than thirty different tools kept in a special magazine. The new machine tool is intended for machining high precision, complexly shaped base members weighing up to 200 kilograms. The use of these automatic machines will more than double labor productivity.

The new machine tool is the result of collaboration between the plant's designers and scientists of a scientific research Institute in Novosibirsk. The team designed the program controlled contour and position systems for machining parts which have made it possible to increase the speed of the manipulators and reduce auxiliary time. The Odessa machine builders now equip all program controlled machine tools of the "machining center" type with fast-action manipulators.

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## METALWORKING EQUIPMENT

### NEED SEEN FOR MORE PRODUCTIVE MACHINE TOOLS

Moscow TEKHNIKA I VOORUZHENIYE in Russian No 9, Sep 81 (signed to press 13 Aug 81)  
pp 2-3

[Article by A. Sukhov, deputy chief of Gosplan USSR's subdepartment and candidate of economic sciences: "The Machine Tool Building Industry"]

[Text] Machine tool building has an important role in progressively developing the national economy, in accelerating scientific and technical progress and in putting economics on an intensive development path. "The overall basis for scientific and technical progress is the development of science," noted General Secretary of the CPSU Central Committee Comrade L. I. Brezhnev in the Accountability Report to the congress, "but machine building is most likely to open the doors broadly for innovation. Machine building is called upon to assimilate and to translate the advances made by scientific and engineering thought into highly efficient, reliable machinery, tools and manufacturing lines without delay."

The machine tool building industry is the heart of machine building. It is planned to carry out the industry's development in two directions: first, to improve the structure of the product being produced so that the incorporation of modern equipment and highly effective production organization methods might be assured; and second, to significantly increase the productivity and quality of machine tool equipment. In particular, the following is envisaged: growth that outstrips the present rate in the output of forging and pressing equipment; production of sets of metal working equipment with automatic manipulators; increased productivity of machine tools, forging and pressing machinery and casting and woodworking equipment by a factor of 1.3-1.6; increased operational reliability and longevity and improved machine tool precision by no less than 20-30 percent.

The urgency of these tasks stems from peculiarities of the recently begun decade during which a number of factors will complicate economic development. In particular, creating highly productive machine tools increases in importance as the growth of labor resources decreases. Creative and labor efforts of the army of Soviet machine tool builders, who number in the thousands, and material and financial resources have been directed primarily at increasing the production of highly precise special and integrated machine tools and automatic lines, at manufacturing heavy and one-of-a-kind machine tools, at producing series of machine tools with numerical program control and at researching new metalworking methods.

Currently the machine tool and tool building industry produces more than 300,000 metal-cutting machine tools and forging and pressing and casting machine tools. Series production of highly precise machine tools for tool building has been mastered, as has one-of-a-kind equipment for heavy and power machine building; mass production of tools from synthetic diamonds has been organized.

During the 10th Five-Year Plan, the output of machine tools with numerical program control increased by a factor of 1.6. Each thousand such machine tools annually saves R 12-15 million and frees about 2500 workers.

Indicators such as the following also attest to changes in the structure of equipment being produced and to changes in the manufacture of its more productive forms. Given a growth in the total output of machine tools of 6.4 percent during the 10th Five-Year Plan, as compared with the Ninth Plan, production of special, specialized, integrated, high-precision, heavy and single-design machine tools, as well as automatic and semi-automatic machine tools and automatic lines grew by 25-60 percent; the production of modern forging and pressing, casting, wood-working equipment and high productivity tools also increased. The proportion of the highest quality category of product grew by a factor greater than 4. Along with this, the development of machine tool studies, broad research in kinematics and machine tool drive, the processes of form making and accuracy of metal-working, an increase in the rigidity of equipment being produced, the automated control and the growing production-technical potential have guaranteed the successful resolution of subsequent tasks. Now the growth rates for the basic productive capital and constant technical improvement of domestic machine building is based on the highly efficient metalworking equipment and tools produced by enterprises of the machine tool and tool-building industry.

Along with this, individual shortcomings have been observed in the operations of the sector in past years. These were spoken of with all frankness at the November (1979) Plenum of the CPSU Central Committee. These shortcomings consist mainly of the high metal consumption of many types of machines and equipment, significant metal wastage during working, inadequately high rates for incorporation of progressive types of castings, an inadequately high technical and quality level for certain types of machinery and equipment and the slow conversion of machine tool building enterprises to produce a new, progressive product.

The decree adopted in March, 1980 by the CPSU Central Committee and the USSR Council of Ministers "On the Significant Increase in the Technical Level and Competitiveness of Metal Working, Casting and Woodworking Equipment and Tools" is of great significance for the further development of machine tool building. In essence, this decree is a comprehensive program in which the multilateral development of practically all links in the sector are specified, and measures, the realization of which will lead the sector to even higher limits, are determined.

Creation of the prerequisites for saving metal, both in machine tool building itself as well as within the national economy as a whole are primary in importance. Therefore creation of designs with less metal consumption, a broadly based incorporation of low-wastage technology during the manufacture are,

therefore, primary directions in the work of scientific-and-research and planning-and-design organizations. As an example, an important role here belongs to a more broadly based incorporation of welded designs into production. The technology for welding more than 200 varieties of framework parts has been developed by colleagues of the Electric Welding Institute imeni Ye. O. Paton.

Measures to create new production capacities are planned for increasing the output of welded designs, particular attention being devoted to mechanization and automation of welding operations, as well as to the scientific organization of manufacturing processes.

A significant reserve for saving metal in the machine tool building industry is hidden behind the use of appropriate production structures for rolled products. For example, the use of sized rolled goods for guide screws provides a metal savings of greater than 20 percent.

The output of billetting equipment permitting low wastage manufacturing processes to be incorporated into machine building is one of the most important tasks of machine tool building. By 1980 the portion of such equipment in the total output of metal working equipment increased by almost 28 percent, as compared with 26 percent in 1975.

The production of automatic manipulators (industrial robots) has been developing more and more in recent years. They are widely used in work with forging and pressing equipment, on metal cutting machine tools, in ovens and heating devices, during painting and application of protective coatings, in welding, assembly and for transport and warehouse operations. Attention to the production of industrial robots increased in connection with the appearance of the decree of the CPSU CC "On Measures to Increase Production and the Broad Application of Automatic Manipulators in Sectors of the National Economy in Light of the Directives of the Twenty-fifth Party Congress" in August, 1980. It is emphasized in the decree that overall mechanization and automation of production based on the broad application of automatic manipulators is one of the important work trends for increasing labor productivity and accelerating scientific and technical progress in the sectors of the national economy. The realization of the program of operations in this area which has been developed will facilitate resolution of labor resource problems during the 11th and 12th Five-Year Plans.

Primary tasks have been posed for the machine tool and tool building industry during the 11th Five-Year Plan: to increase productivity of automatic lines for machine building and metal working by 40 percent for automatic and semi-automatic machine tools of all technological groups by more than 58 percent, of special and integrated machine tools by almost 33 percent and of machine tools with numerical program control by a factor of 3.3. It is planned to increase output of casting equipment of all types by more than 70 percent, while equipment with program control designated for the woodworking industry will be increased by a factor of 3.

Production of the most efficient types of tools should receive all-out development. For example, output of tools equipped with multi-sided plates ['instrument, osnashchenny mnogogrannymi plastinami] and of tools with plates covered with

wear-resistant materials will increase by a factor of 9.2, and cutting tools made from poly-crystalline diamonds, boron nitride and other super hard materials by a factor of 2.

The effective use of equipment and tools which will be manufactured during the 11th Five-Year Plan will permit us to free approximately 2 million persons (of these 1.3 million lathe operators) and conserve 1.5-1.6 million tons of metal.

The further development of the machine tool and tool building industry will promote the goal of increasing production efficiency which was advanced by the 26th Party Congress.

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METALWORKING EQUIPMENT

'PRO FORMA' RESPONSES TO READER QUERIES CRITICIZED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Aug 81 p 2

[Article by Department of Machine Building and New Equipment of the newspaper SOTSIALISTICHESKAYA INDUSTRIYA: "Around and About: We Return the 'Pro Forma' Response"]

[Text] "Questions raised in the article are urgent and require an unconditional solution;" "The facts which were set forth actually occurred;" "The author's proposals merit all possible support." An overwhelming majority of official responses to newspaper articles begin with similar phrases. They indicate that acute, burning problems have been touched upon and that their resolution will be of benefit to society. It seems as though one need not worry about whether or not the problems will be solved and the shortcomings eliminated. After all, responsible leaders place their signatures under the official responses.

However, it is often the case that after acknowledging the correctness of the newspaper article, the authors of the responses raise such a dense veil of verbal fog that it is extremely difficult to see anything concrete.

The Bryansk Motor Works was subjected to criticism in the correspondence from A. Burkal'tsev "An Unbusinesslike Approach to Business Waste" for scrapping metal which is fully suitable for use and for even making a special effort to break it up into small pieces for convenience. The general director of the production association I. Leshtan reacted to the criticism promptly. There was no denial in the response. On the contrary, it began with the invariable "The facts occurred." But the very next phrase puzzled us greatly: "The plant is making maximum use of wastes from production." Not somewhat, but maximum use! And a list of enchanting figures follows in confirmation: the cutting-out coefficient, the usage coefficient... And now one must guess--could it be that one should not criticize but praise the Bryansk Motor Works? And how will it be in the future -- will the facts of the conversion of useful metal into waste "be included" or not. It is impossible to understand this from I. Leshtan's response.

Then the response of V. Pavlov, a member of the board of the USSR Ministry of the Petroleum Refining and Petrochemical Industry, leaves no doubt that after the article "Legalized Wastefulness" by V. Gel'man, the changes for which the author struggled will hardly be forthcoming. Although in all conscientiousness, he

acknowledges the correctness with which the question is posed. We are again speaking of an important problem associated with conserving material resources. According to existing regulations, in order to receive industrial rubber items, each enterprise must deliver its own dies to the supplier plant along with its order. And it came to be the case that they were forced to set up semi-primitive, unprofitable production of them at their own plants. As a result, money and metal is wasted.

And how does V. Pavlov intend to solve the problem? On two pages, delving deeply into details and even into the history of the problem, he laments how complex the problem is and how difficult it is to solve it. And not a word about what specific steps are being taken toward its solution. The author's proposal, for a start at least, to eliminate delivery of dies for standard parts, thereby reducing costs significantly is ignored. The sole conclusion which grows out of this response is that the Ministry is entirely satisfied with the situation as it exists. Certain other authors of 'pro forma' responses also use the "method of omission," to bypass, as if unnoticed, specific questions posed right in the article. Here is an example of how the deputy Minister of the Machine Tool and Tool Building Industry G. Fedorovskiy reacted to a newspaper article:

In the material for [the article] "Although 'Tsentrrolit' [Central Casting Plant] has been Built," the authors E. Korovalov and Ye. Borsch precisely illuminated the problem: construction of "Tsentrrolits" [central casting plants] does not of itself free the enterprises of a region (in the given instance Odesskaya Oblast) from primitive small-scale casting. It is necessary to establish efficient economic ties which exclude long-distance and overlapping shipping. G. Fedorovskiy responds to this as follows: "...Deliveries to outlying areas will diminish as the necessary facilities are started up in other regions." But it is stated directly in the article: castings are transported from Odessa to the very same regions where there already exist "Tsentrrolits," to the Transcaucasus, to the Pribaltic region, etc. However the deputy Minister passes over these facts. Nor does he pay attention to another specific example: for how many years have identical castings been passing each other over overlapping routes from Shakhtinsk to Odessa and back, with state money flying away on the wind.

Diffusiveness and vagueness are true means for moving away from the essence of things. However, no matter how strange it seems at first glance, it is even possible to cover something with a fog by using specific figures and promises. When individual shortcomings are criticized in the newspaper, it is assumed that not only will they themselves be corrected, but also the causes which generate them as well. Doubtless it was just this that was in mind when the newspaper published an article by A. Kobzey "Let Us Take Measures for Unloading." He spoke about the fact that agricultural machine building plants did not supply adequate spare parts for their equipment to the Lipetskiy Oblast association "Sel'khoztekhnika" [Agricultural Equipment Association] making the latter's preparations for spring field work more difficult. The deputy Minister of Tractor and Agricultural Machine Building V. Chernov assured us in response to this article that measures had been taken toward delivery of spare parts to Lipetskaya Oblast based on funds for the first half-year, and ahead of schedule (!). And further, there was an entire list of favorable numerical data on the status as of May 1. Time

passed. Harvest started up on Lipetsk soil. The editors took an interest in how things were with spare parts. "Everything is the same," answered I. Kostin, a worker at the oblast association "Sel'khoztekhnika, "we are making do as best we can." It turns out that during the first half-year, the delivery of 30 parts was either partially or totally disrupted.

And it's no accident that many readers are forced to turn to the editors a second time. At the Kuybyshev plant "Elektroshchit" of the USSR Ministry of Power, a new, promising design for a self-contained switchboard unit (KRU) was developed for power substations. Having just heard of the new KRU, consumers (workers in the gas and petroleum industry, builders and transport workers) literally flooded the plant with orders.

And the plant is ready for series production of this very necessary product. But a "VK-10" oil-type circuit breaker is required in its manufacture. In its turn, while development of the new design was in progress, the managers of the VPO [All-union Production Association] "Soyuztransformator" of Minelektrotekhprom [Ministry of the Electrical Equipment Industry] assured them that they would supply the Kuybyshevites with the units to complete the design. And, moreover, they had speeded them up, setting rigid delivery deadlines for the circuit breakers. But these deadlines have long since passed, and the plant has not yet been able to begin production of the KRU, the stumbling block being these very same ill-fated circuit breakers. Workers at the "Elektroshchit" plant A. Dushkin, S. Tregubov and V. Gasyuk told about all of this in the article "Administrative Dead-end" published in SOTSIALISTICHESKAYA INDUSTRIYA.

An official response followed the article over the signature of G. Voronovskiy, first deputy Minister of the Electrical Equipment Industry. Having admitted the situation which was described in the article conformed to actuality, he reported, "proceeding from the presence of existing facilities, the VPO "Soyuztransformator" and the Glavenergostroymekhanizatsiya [Main Administration for Mechanization of Power Construction] of the Ministry of Power jointly examined the question of the manufacture of self-contained switch-board units and delivery of the "VK-10" circuit breakers for the Kuybyshev plant 'Elektroshchit' in 1981. This resolution was formed through a joint protocol." It remained to hope that if "the question had been examined," then that it had also been solved.

A half year passed. The editors telephoned Kuybyshev. Having learned that they were being called from the newspaper, "Elektroshchit's" head designer Ye. Polovinkin exclaimed, "We have just sent you another letter." It turns out that after the newspaper article, Minelektrotekhprom "loosened the purse strings" for only 125 circuit breakers. This quantity is adequate for production of an adjustment batch ['ustanovochnaya partiya']. No less than 8,000 of them per year are required for series production. Minelektrotekhprom does not promise that many by the end of the five-year plan. Thus, although the question has been examined and even a "resolution has been formulated by a joint protocol," the response of first deputy Minister G. Voronovskiy, which gives hope at first glimpse, is only a 'pro forma' response, after which the situation did not change for practical purposes.

Can such an approach to business really be called businesslike? We are therefore returning to the authors the 'pro forma' responses cited above.

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